



Defense Information Systems Agency

A Combat Support Agency

World Radiocommunication Conference (WRC-12) Update/Issues/Strategy

**Defense Spectrum Organization (DSO)
19 July 2010**

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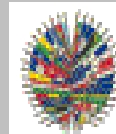
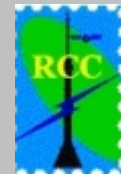
Overview

- **Provide status of DOD preparation for World Radiocommunication Conference 2012 (WRC-12), January 2012**
 - **DOD Participation in the WRC**
 - **High-Interest WRC-12 Agenda Items**

What is the WRC?

- **International forum for world agreement within the International Telecommunication Union (ITU)**
- **Reviews and revises the ITU-R Radio Regulations, considers new global spectrum allocations**
- **Roughly every 4-5 years**
- **Operates by consensus, voting only rarely**
- **Sets the world stage for future technological development**
- **Balances commercial, governmental, scientific uses of spectrum**
- **Nations and Regional groups prepare proposals for negotiation**

Regional Preparation



CITEL

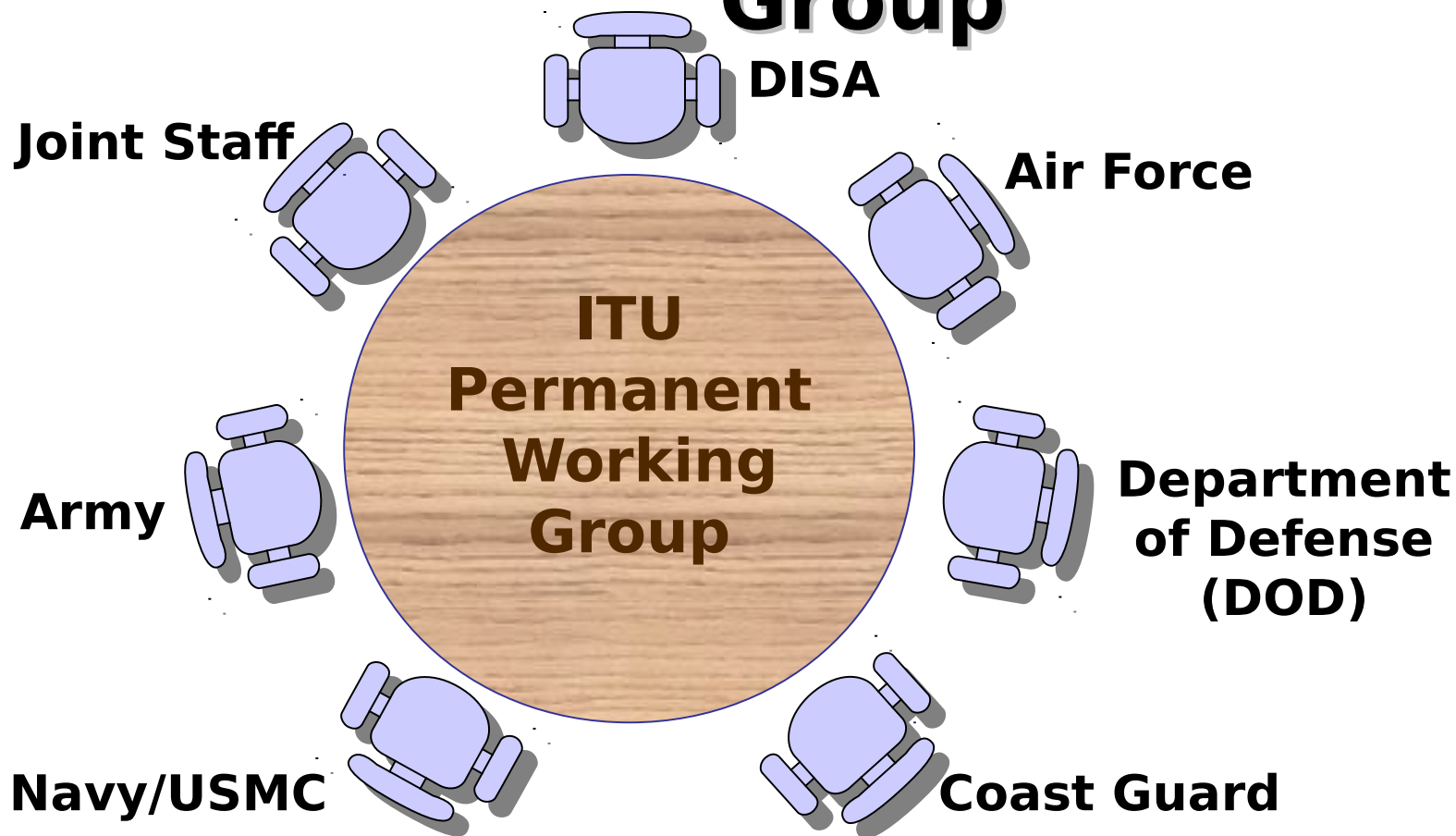
DOD WRC Participation

- **Purpose:** To promote the ability of the U.S., its allies, and coalition partners to access spectrum resources in support of military operations worldwide

Military Combatant Command & Allied Preparation



MCEB Frequency Panel ITU Permanent Working Group



**Open to all of United States Department of
Defense**

High-Interest WRC-12 Agenda Items

AI No.

Subjects

- | | |
|--------------------|--|
| 1.3 | Unmanned Aerial Systems (UASs) |
| 1.4 | Aeronautical Service (AM(R)S) |
| 1.5 | Electronic News Gathering (ENG) |
| 1.15 | HF Radars (3-50 MHz) |
| 1.19 | SDR and Cognitive Radios |
| 1.21 | Radar Allocation at 15 GHz |
| 1.25 | New Mobile Satellite |
| Allocations | |
| 8.2 | Future WRC Agenda Items |

AI 1.3 - UAS Allocation

- **AI considers allocations for safe operation of unmanned aerial systems**
- **Pending results of studies, US could support modifications to allocation of AM(R)S/AMS(R)S, or new allocations**
 - **US proposal provides an AM(R)S allocation in the 5030-5091 MHz**
- **AI considers command and control and Air Traffic Control (ATC) functions in non-segregated airspace, not payload comms**



AM(R)S - An *aeronautical mobile route service* reserved for communications relating to safety and regularity of flight, primarily along national or international civil air routes.

AMS(R)S - A *mobile-satellite service* in which *mobile earth stations* are located on board aircraft; *survival craft stations* and *emergency position-indicating radiobeacon stations* may also participate in this service.



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AI 1.3 - UAS Allocation (cont.)

- **Potential Impact to DoD: Due to the flight-safety critical nature of UAS operation, additional regulatory restrictions may be imposed on current and future DoD UAS operations which may require the use of specific frequency bands not available on current UAS platforms.**

AI 1.3 - UAS Allocation (cont.)

- **DOD goal of flexibility: not have to use civil spectrum (i.e., more radios on UAV), not give civil UAV access to DOD spectrum**
- **Working with FAA and others to allow regulatory flexibility for use of spectrum for military ops**
- **Difficult and complex; ties to other Agenda Items**
- **AI 1.21 wants 15.4-15.7 GHz**
- **AI 15.63 GHz**





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AI 1.3 - UAS Allocation (cont.)

- **Summary of DOD position: Based on results of studies, DOD supports:**
 - **Existing or new AM(R)S/AMS(R)S allocations for UAS command and control, including ATC communications**
 - **Existing or new radiodetermination allocations for UAS sense and avoid**
 - **Use of these or other bands predicated on studies showing compatible operation with incumbents**

AI 1.4 - AMRS Allocations

- **AI consider regulatory measures to facilitate introduction of new AM(R)S systems in three bands**
- **Res 413: 112-117.975 MHz; no DOD issues**
- **Res 417: allocation already exists in the 960-1164 MHz band**
 - **DOD needs to protect JTIDS/MIDS in-band**
 - **Emission limits set to protect GPS in adjacent 1164-1215 MHz band**

AI 1.4 - AMRS Allocations (cont.)

- **Res 420: seeking new allocation in 5000-5030 MHz band**
 - **DOD needs to protect GPS**
 - **Currently in negotiations with NTIA and FAA**
 - **GPS uplink in the 5000-5010 MHz band**
 - **U.S. agreement to allow AM(R)S domestically and internationally**
 - **GPS downlink in the 5010-5030 MHz band**
 - **U.S. agreement to allow AM(R)S domestically only and stop pursuit of international allocation**
- **Potential Impact to DoD: Potential interference from AMRS into JTIDS/MIDS, GPS, and future GPS/RNSS**

AI 1.5 - ENG

- AI considers worldwide/regional harmonization of spectrum for Electronic News Gathering (ENG)
- DOD opposes any action that would negatively impact operations
- Focusing on the following bands; **red** highlights indicate DOD equities:
 - Audio: <174 MHz, 174-223 MHz, 470-870 MHz, 925-932 MHz, **1452-1479.5 MHz**, 1700-1710 MHz, **1785-1805 MHz**
 - Video: **2025-2110 MHz**, **2200-2450 MHz**, **4400-5000 MHz**, **5250-5725 MHz**, 6870-7750 MHz, 8400-8500 MHz, **10-10.65 GHz**, 12.0-12.2 GHz, 12.75-13.25 GHz, **21.2-24.5 GHz**, 39-40 GHz, 47.2-50.2 GHz
- DOD studying potential impact; outreach to take focus off equity band

AI 1.5 - ENG (cont.)

- **Bands of interest included for study with DOD equities:**
 - **1452-1479.5, 1785-1800 MHz, 2025-2110 MHz, 2200-2450 MHz**
 - **Fixed, tactical radio relay and mobile systems**
 - **Tactical radio relay, radar, video links, military satellite**
 - **Military and airborne telemetry, including, real-time telemetry during flight testing**
 - **Air Force Space Space-Ground Link System (SGLS) and NASA Unified S-Band Transponder**
 - **Future military requirements: Autonomous Air Combat Maneuvering Instrumentation (AACMI)**

AI 1.5 - ENG (cont.)

- **Bands of interest with DOD equities (cont):**
 - **4400-5000 MHz**
 - **Essential military requirements for fixed, tactical radio relay and mobile systems**
 - **Tactical radio relay, Unmanned Aerial Vehicle and Remote Piloted Vehicle video links**
 - **Future military requirements: Maritime data link**
 - **5250-5850 MHz**
 - **Essential military requirement for land, airborne and naval radars**

AI 1.5 - ENG (cont.)

- **Bands of interest with DOD equities (cont):**
 - **8.5-10.5 GHz (10-10.68 GHz)**
 - **Military requirement for land, airborne and naval radars**
 - **Future Military requirement: High discrimination radar**
 - **Impacts 500 MHz (10-10.5 GHz)**
 - **24.05-24.25 GHz**
 - **Military requirement for radiolocation systems**
- **DOD position: A global harmonization in bands where DOD operates could present operational concerns to terrestrial and satellite operations. DOD opposes any action that would harm**

AI 1.15 - HF Radars

- **AI examines possible new spectrum allocations in the 3-50 MHz range for oceanographic radars**
 - **Manufacturers and researchers have settled on frequencies near:**
4.5 MHz $\pm$ 1 MHz, 9 MHz $\pm$ 1 MHz, 13 MHz $\pm$ 1 MHz, 16 MHz $\pm$ 1 MHz, 26 MHz $\pm$ 4 MHz and 43 MHz $\pm$ 4 MHz
- **Potential Impact to DOD: Potential interference to military communications systems including Civil Air Patrol (CAP), Automatic Link Establishment (ALE) and AMC SINCGARS, as well as current high power HF radar systems (e.g., ROTH).**
- **DOD position: support secondary allocations to protect existing HF communications operations**

AI 1.19 - SDR and CRS

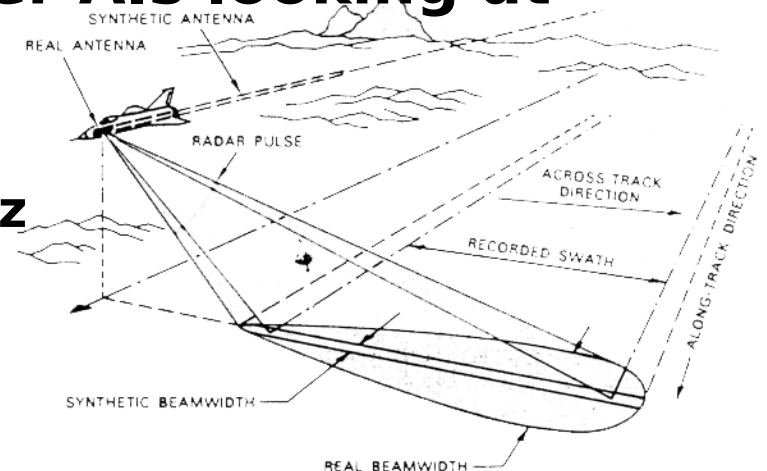
- **AI considers regulatory measures to enable introduction of Software Defined Radio (SDR) and Cognitive Radio Systems (CRS)**
- **All services and equipment may be affected by decisions**
- **DOD supports “No Change” - no new regulatory measures, oppose specific allocations**
- **US proposal and Draft CITEI Inter-American Proposal for “No Change”**

AI 1.19 - SDR and CRS (cont.)

- **DOD in good position on this AI—CPM text supports NOC for SDR, NOC for CRS with a proposal for a WRC Resolution to continue studies in the Working Parties**
 - **After this months WP 1B meeting, DoD may lower status from high priority**
- **DOD position: DOD supports “No Change” - no new regulatory measures, oppose specific allocations**

AI 1.21 - 15 GHz Radar

- AI proposes to establish a primary allocation for radiolocation in the 15.4-15.7 GHz band
- DOD supports the primary allocation
- There is a need to protect incumbent systems such as Aeronautical Radionavigation Service (ARNS)
- Success threatened by other AIs looking at portions of this band:
 - AI 1.3 wants 15.4-15.5 GHz
 - AI 1.25 wants 15.43-15.63 GHz



AI 1.21 - 15 GHz Radar (cont.)

- **DOD position:** DOD strongly favors achieving a primary allocation for Radiolocation in this band, while protecting existing services in the band. The DOD notes that the current allocation for NGSO FSS feederlinks is not used, nor has any planned deployment of NGSO feederlinks been indicated in any application to the ITU Radiocommunication Bureau.
- **Potential benefit to DOD:** Increased contiguous bandwidth for radar operations to improve targeting and imaging

NGSO - Non-geostationary satellite orbit.

FSS - *A radiocommunication service between earth stations at given positions, when one or more satellites are used; the given position may be a specified fixed point or any fixed point within specified areas; in some cases this service includes satellite to-satellite links, which may also be operated in the inter-satellite service; the fixed-satellite service may also include feeder links for other space radiocommunication services.*

AI 1.25 - MSS

- **AI considers possible additional allocations to the mobile-satellite service in the 4-16 GHz range**
- **DOD supports more spectrum for MSS, but must ensure no interference to existing DOD systems**
- **Bands of interest with DOD equities:**
 - **5150-5250 MHz, 7055-7250 MHz, 8400-8500 MHz, 10.5-10.6 GHz, 13.25-13.4 GHz, and 15.43-15.63 GHz**
- **DOD studying impact; outreach to take focus off equity bands**
 - **Submitted study of 15.43-15.63 GHz band to ITU**
- **Other administrations / private sector continuing to study**

AI 1.25 - MSS (cont.)

- **Potential conflict with other Agenda Items**
 - **AI 1.3 wants 15.4-15.5 GHz**
 - **AI 1.21 wants 15.4-15.7 GHz**
- **DOD proposal: New allocations could impact DOD radars, microwave systems, aeronautical telemetry and satellite links. DOD will oppose any allocation that does not protect DOD systems.**
- **Potential Impact to DOD: Additional regulatory and operational burdens could result on DoD systems, due to the potential for interference into and/or from a myriad of DOD operations in the 4-16 GHz range.**

Additional AIs

- **AI 8.2 - DOD monitors proposals for future WRC agenda items for threats to DOD equities**
 - **DoD is not currently proposing any future agenda times**
- **AIs 1.8 and 1.14 downgraded from high to medium interest because DOD team worked to reduce the threats posed to our equities**
 - **1.8: Existing DOD satellites will be protected from interference by any new fixed services**
 - **1.14: Shifted focus away from a band with DOD equities to a band without DOD equities**

Conclusions

- **DOD is a global user of spectrum and is subject to administrations' rules and policies**
- **DOD faces national and global pressure to use spectrum more efficiently and effectively**
- **DOD is actively involved in U.S. spectrum policy development, which is tied to the high interest WRC Agenda Items**
- **DOD is heavily involved in international regulatory decision making**
- **DOD participates in the ITU and WRC, with extensive collaboration among other nations -- is the key to success**



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